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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/089,430	03/29/2002	Tetsujiro Kondo	450108-03399	6919

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NEW YORK, NY 10151

EXAMINER
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HAN, QI

ART UNIT	PAPER NUMBER
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2626

DATE MAILED: 06/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/089,430	<b>Applicant(s)</b> KONDO ET AL.	
	<b>Examiner</b> Qi Han	<b>Art Unit</b> 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 April 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) 1-18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

#### ***Response to Amendment***

2. This communication is responsive to the applicant's amendment dated 04/05/2006. The Applicant(s) amended specification (see the amendment: pages 2-7).

The examiner withdraws the disclosure objection regarding issues c, d, e and f, because the applicant amended and/or clarified the corresponding content of the specification. The objection regarding the other issues is sustained because the related subject matter still has problem and/or the corresponding argument is not persuasive (see the disclosure objection below).

The claim objection is sustained, because the applicant's argument is not persuasive (see detail below).

The rejection of claims 2, 6, 9, 12, 15 and 18 under 35 USC 112 2<sup>nd</sup> is sustained, because the applicants forgot to make the amendment, although they say so (see the amendment: page 18, paragraph 2).

The examiner withdraws the claim rejection of claims 1-2, 4-5, 7-8, 10-11, 13-14, 16-17 under 35 USC 112 1<sup>st</sup>, because the applicant insist that "no undue experimentation is required to practice the claimed invention".

The rejection of claims 2, 6, 9,12,15 and 18 under 35 USC 112 1<sup>st</sup> is sustained, because the applicant's argument regarding normalized self-correlation function (the amendment: page 19, paragraphs 3-4) is nothing to do with the claimed "elimination the amplitude element of the digital signal".

### ***Response to Arguments***

3. Applicant's arguments filed on 04/05/2006 with respect to the rejection under 35 USC 102 and/or 103, have been fully considered but they are not persuasive.

In response to applicant's arguments with respect to claim 1 (also related to claims 4,7,10,13 and 16) that "nothing has been found in Imai or Thyssen to suggest that the prediction method is selected to correspond to the obtained class" as the claimed "by prediction-operating the digital signal by a prediction method corresponding to the obtained class" (the amendment: page 21, paragraphs 2-4), the examiner respectfully disagrees with applicant and has a different view of prior art teachings and the claim interpretations. It is noted that the claimed limitation of "generating a new digital signal..., by prediction-operating the digital signal by a prediction method corresponding to the obtained class", is very broad, so that any generated digital signal through any prediction operation related to a class obtained can be read on the claim. It is also noted that, as stated in the rejection, Imai teaches classifying classes by using auto-correlation (col. 7, lines 20-26) and Thyssen teaches 'efficient signal representations (generated digital signal) can be determined by estimating and applying certain prediction parameters to represent the signal (prediction-operating the digital signal)' (paragraph 4), so that the combined

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references teach the limitation as claimed. In addition, by reviewing the prior art, it is noted that Thyssen further discloses classification (paragraph 91) and a speech classifier (paragraph 222), which are related to prediction processing (paragraphs 102-104), so that Thyssen's disclosure alone can satisfy the claimed and argued limitation.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning (the amendment: page 22, paragraphs 2-3), it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response to applicant's argument that there is no suggestion to combine the references (the amendment: page 22, paragraphs 4-5, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the obviousness is based on the prior art teachings, because both references provide classification for audio digital signal (to solve the same or similar problem), calculate auto-correlations, and use the result of autocorrelations for the classification (directly or indirectly). In addition, it is noted that Thyssen's disclosure alone

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can satisfy the claimed and argued limitation (as stated above). Therefore, the combination of the prior art references, regarding obviousness and/or motivation, is proper.

For above reason, the rejection is sustained.

### ***Specification and Drawing***

4. The amendment filed 04/05/2006 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

Regarding Equation 4, according to the admission in the amendment that “applicants respectfully submit that a simple trigonometric transform will transform Equation 4 into the well-known Hamming function definition” (the amendment: page 14, last paragraph), the amended equation 4 (see the amendment: page 4) introduces new subject matter, because I) the amended equation 4 is substantially different from the original equation (see specification: page 12); ii) it is not well known to one skilled in the art to prove that the old and new equations can be transformed from one to the other; and/or iii) applicants fail to specifically prove their statement above. Applicant is required to cancel the new matter in the reply to this Office Action, or to provide appropriate evidence to prove the issue iii above, or file a CIP.

5. The disclosure is objected to because of the following:

(1) The amendment (see pages 4-7) for specification uses paragraph number (such as [0025]) to refer the amended content, but the original specification has no such number references, which are inconsistent with each other. Appropriate correction is required.

(2) the amended terms “the **data value**[level] of each class tap” (the amendment: on page 4, paragraph 2) is unclear. Appropriate correction or explanation is required.

(3) regarding equation 10, some symbols in the amended equation (the amendment: page 6) are not readable (too small). A clearly readable copy of the amendment is required.

(4). on page 28, paragraph 3, the disclosure says “in the learning circuit 30 (see Fig. 8), the student signal generating filter 37 conducts the thinning processing of ... **taking the interpolation processing in the audio signal processing device 10 into consideration ...**” It fails to disclose that what relationship is between device 30 and device 10. It also lacks an antecedent basis for the interpolation processing in device 10. Appropriate correction or explanation is required.

It is noted the applicant’s argument and the recited contents of the specification (the amendment: on page 16, paragraphs 4-5) do not clearly explain the exact structural relationship between “between device 30 and device 10”. For example, the only connection between device 30 and device 10 is that both has a output to memory 15 (see Fig. 1 and 8), but no other indication/relationship at all, so that it unclear that whether device 30 is in device 10 or not, whether D36 and D13 are the same or not, how the signals in device 10 are related to any signals in device 30.

Since many errors are found as stated above, the lengthy specification has not been checked to the extent necessary to determine the presence of all possible errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification. It is also reminded that there is no new subject matter allowed in the future amendment. If any new subject matter or material change has to be added to the original specification by amendment, filing a CIP is a proper solution, according to the requirement of 35 USC 112 for the claimed limitations.

### *Claim Objections*

6. Claim 1-18 are objected to because of the following:

Regarding claims 1-18, the claimed limitation is about processing “**digital signal**”, which has much broader scope than that of processing “digital **audio** signal (audio data)” described in the specification (see page 4, paragraph 5 and Fig. 1). It should be pointed out that the applicant’s argument that “the instant invention may be used on any kind of signal, such as audio signal or an image signal” and “the specification clearly teaches how the present invention may be applied to digital image signals” (the amendment: page 17, paragraph 3), is not persuasive. By reviewing the instant application, particularly including the applicant’s referenced contents (see specification: page 4, paragraph 3 and page 33 paragraph 3), the specification lacks to specifically describe how can apply the claimed invention, as whole, to image signal; and the disclosure applying to audio signal does not render an obviousness and/or enablement for one skilled in the art to use or make the invention to apply it to image or other totally different digital signal. For example, the disclosed equations for audio signal are all based on one-dimensional



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processing, which cannot make it obvious or enable to use them in a normal work operation for two-dimensional signal, such as image, without undue experimentation, because the two different dimensional digital signals have totally different characteristics, and need different mathematical equations, computational complexities (time and space), and experimental knowledge in different fields. Therefore, this is an inappropriate broad claim limitation, which, as whole, not only lacks specific description in the specification, but also may cause scope and/or enablement problem, as state above, under 35 USC 112 1<sup>st</sup>. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

7. Claims 3, 6, 9, 12, 15 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 3, the claim recites the limitation "eliminating **the amplitude element** of the digital signal" in last line of the claim. There is insufficient antecedent basis for the limitation in the claim.

Regarding claims 6, 9, 12, 15 and 18, the claims have the same situation as claim 3, so that the rejection is based on the same reason as claim 3 (see above).

8. Claims 3, 6, 9, 12, 15 and 18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding claim 3, the limitation “the self correlation coefficients are calculated **after eliminating the amplitude element of the digital signal**” has an enablement problem, because according to Equation (5) (see specification, page 13), the signal waveform  $g(i)$  or  $g(i+t)$  corresponds to the amplitude element of the digital signal and is used for calculating the self correlation. At this point, the claimed limitation directly conflicts the disclosure in the specification. Further, if the amplitude element of the digital signal is eliminated, the self-correlation cannot be calculated at all. Therefore, the claimed limitation was not described in the specification in such a way as to enable one skilled in the art to make and/or use the claimed invention without undue experimentation.

Similarly, claims 6, 9, 12, 15 and 18, have the same problem as claim 3 since they recite the same or similar limitation as claim 3, so that the rejection is based on the same reason as described for claim 3.

### ***Claim Rejections - 35 USC § 103***

9. Claims 1-2, 4-5, 7-8, 10-11, 13-14 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over IMAI et al. (US 6,360,198 B1) hereinafter referenced as IMAI in view of THYSSEN (US 2002/0138256 A1).

As per **claim 1**, as best understood in view of the claim objection (see above), IMAI discloses ‘audio processing method, audio processing apparatus, and recording reproduction apparatus cable of outputting voice having regular pitch regardless of reproduction speed’ (title), comprising:

“a step of cutting parts out of the digital signal by plural windows having different sizes and calculating their respective self correlation coefficients” (col. 2, lines 20-26, ‘after having performed digital signal processing on the audio data’; col. 7, lines 22-26, ‘performing (calculating) auto-correlation (self correlation) analysis (necessary including the correlation coefficients) for each of the voiced sound, unvoiced sound, and silent...’ ; col. 7, line 62 to col. 8, line 15, ‘auto-correlation analysis is performed using a plurality of window widths (corresponding to plural windows having different sizes) having different values’);

“a step of classifying the parts into a class based on the calculation results of the self correlation coefficients”, (col. 7, lines 20-26, ‘classifying the resulting data into voiced sound, unvoiced sound, and silent...processing of performing auto-correlation (self correlation) analysis for each of the voiced sound, unvoiced sound, and silent’; Fig. 1) ; and

“a step of generating a new digital signal which is obtained by the digital signal”, (col. 8, lines 37-38 and Fig. 1, ‘supplies (generates) the thus-read-out data (new digital signal) to the audio data connection part’).

But, IMAI does not expressly disclose generating the new digital signal “by prediction-operating the digital signal by a prediction method corresponding to the obtained class” However, this feature is well known in the art as evidenced by THYSEN who discloses ‘low complexity random codebook structure’ (title), and teaches ‘efficient signal representations can be determined by estimating and applying certain prediction parameters to represent the signal (prediction-operating the digital signal)’ (paragraph 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify IMAI by specifically providing a mechanism for estimating and applying certain prediction parameters to represent the

signal, taught by THYSEN, for the purpose (motivation) of modeling a signal value according to an earlier value (THYSEN: paragraph 4).

As per **claim 2** (depending on claim 1), as best understood in view of the claim objection and claim rejection under 35 USC 112 2<sup>nd</sup> (see above), IMAI in view of THYSEN further discloses “at least a general searching range and a local searching range are provided as targets for calculating the self correlation coefficients with respect to the digital signal, and the self correlation coefficients are calculated based on the searching ranges”, (THYSEN: paragraph 82, ‘the autocorrelations of the windowed speech are computed’; ‘paragraphs 115-139, ‘estimation of the precise pitch lag... based on the normalized correlation (self correlation)’, ‘the size L is defined according to open-loop pitch lag  $T_{op}$  with the corresponding normalized correlation’, and ‘one integer k is maximizing the  $R_k$  (the normalized correlation) in the range  $[T_{op} - 10, T_{op} + 10]$  (local range) bounded by  $[17-145]$  (general range)’ and other related ranges; paragraphs 143-160, ‘local integer shifting range  $[SR0, SR1]$  (local range, herein the range  $[T_{op} - 10, T_{op} + 10]$  is referred as global range) for searching’).

Regarding claims 4 and 7, the rejection is based on the same reason described for claim 1, because the claims recite the same or similar limitations as claim 1, respectively.

Regarding claims 5 and 8, the rejection is based on the same reason described for claim 2, because the claims recite the same or similar limitations as claim 2, respectively.

As per **claim 10**, as best understood in view of the claim objection (see above), the rejection for claimed elements 2-4 (herein corresponding to steps 2-4) is based on the same reason described for claim 1, because the elements recite the same or similar limitations as claim 1. In addition, regarding claimed element 1, IMAI in view of THYSEN further discloses “a

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step of generating, from a desired digital signal, a student digital signal in which the digital signal is degraded”, (IMAI: col. 2, lines 443-44, ‘thinning of the audio data’; col. 7, ‘decimation processing of decreasing the sampling rate of the audio data’, which inherently causes the audio signal (data) degraded, as claimed).

Regarding claim 11 (depending on claim 10), the rejection is based on the same reason described for claim 2, because the claim recites the same or similar limitations as claim 2.

Regarding claims 13 and 16, the rejection is based on the same reason described for claim 10, because the claims recite the same or similar limitations as claim 10, respectively.

Regarding claims 14 and 17, the rejection is based on the same reason described for claim 11, because the claims recite the same or similar limitations as claim 11, respectively.

### ***Conclusion***

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Effective January 14, 2005, except correspondence for Maintenance Fee payments, Deposit Account Replenishments (see 1.25(c)(4)), and Licensing and Review (see 37 CFR 5.1(c) and 5.2(c)), please address correspondence to be delivered by other delivery services (Federal Express (Fed Ex), UPS, DHL, Laser, Action, Purolater, etc.) as follows:

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qi Han whose telephone numbers is (571) 272-7604. The examiner can normally be reached on Monday through Thursday from 9:00 a.m. to 7:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richmond Dorvil, can be reached on (571) 272-7602.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Inquiries regarding the status of submissions relating to an application or questions on the Private PAIR system should be directed to the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028 between the hours of 6 a.m. and midnight Monday through Friday EST, or by e-mail at: [ebc@uspto.gov](mailto:ebc@uspto.gov). For general information about the PAIR system, see <http://pair-direct.uspto.gov>.

QH/qh  
June 21, 2006

  
RICHEMOND DORVIL  
SUPERVISORY PATENT EXAMINER